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A LIST OF U.S. INSTITUTIONS POSSESSING COLLECTIONS OF MARINE MAMMAL OSTEOLOGICAL SPECIMENS

by

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INTRODUCTION

A major emphasis in modern management and conservation of marine mammals is on management by population stock, because different populations of the same species quite often have different histories of exploitation and different levels of natural mortality and reproduction. What is sound management policy for one population is not necessarily so for another population of the same species. For these reasons, the International Whaling Commission and other management bodies, national as well as international, have increasingly moved to management on a stock-by-stock basis.

For many, if not most, marine mammals, populational variation and subdivision within the species are very poorly known and understood. The reasons for this are that the decision as to whether or not a particular subdivision exists below the species level is based on morphology (osteology, coloration, body size and shape, etc.), and morphological differences at this level are average (not absolute) differences, requiring rigorous analysis of data from large numbers of specimens. Thus, modern management relies on the availability of large numbers of specimens. Unfortunately, marine mammal specimens are very difficult and expensive to collect, process, and store. Consequently, most museums and other repositories possess only synoptic collections, or, at best, a few dozen specimens of any marine mammal, whereas they may have hundreds or even thousands of specimens of a particular mouse or other small animal. Given this situation, it usually becomes necessary to examine the specimens in several or many collections before it is possible to conclude whether or not a particular subdivision of a species is justified. Before a collection can be used, of course, one must know what is in it; it must be cataloged and documented in a readily accessible publication or report.

Because of growing U.S. - U.S.S.R. collaboration in research and management programs for marine mammals of mutual interest, the U.S.S.R. - U.S. project on marine mammals in meetings in La Jolla, California in 1977 and in Ulan Ude, U.S.S.R. in 1978 endorsed the concept of cataloging world collections of marine mammal osteological collections and agreed to assist and expand an existing cataloging effort by the U.S. National Museum of Natural History. This program has been underway for several years, with many major collections in the U.S. and Europe already documented, but has included the Soviet Union only since very recently and on a small scale. Two major Soviet collections of cetaceans, in Leningrad and Moscow, were cataloged in 1976 by a U.S.S.R.-U.S. team of specialists. (Perrin, Sokolov, and Kuzmin, M.S.). As the first step in a comprehensive cataloging program, the two sides agreed to compile and exchange lists of collections in the U.S. and U.S.S.R. which contain marine mammal specimens. The present list was compiled for that exchange.

METHODS

One hundred forty-five institutions, including universities and colleges, museums, government agencies, and oceanaria were surveyed. A list of institutions with marine mammal specimens compiled by Mead in 1973 served as a starting point for this survey. Other institutions were located by reviewing catalogs of museums and educational institutions and other publications (see references). Each institution was first contacted by telephone. If the institution had marine mammal osteological specimens (a specimen may be anything from a single bone to a complete skeleton) an estimate of the number of specimens was obtained and a checklist questionnaire was mailed to the institution in order to obtain a more detailed inventory of the collection. Eighty-five percent of the questionnaires were returned.

RESULTS

Of the institutions surveyed, 82 had marine mammal osteological specimens (Table 1) and 63 did not (Table 2). The collections are broken down into 4 taxonomic groups: cetaceans, pinnipeds, sirenians, and sea otters. Six institutions reported only total numbers of marine mammal specimens.

Of the approximately 17,300 specimens located, about 45% are cetaceans, 45% pinnipeds, about 5% sirenians, and 5% sea otters (as an early form of the questionnaire included only cetaceans, pinnipeds, and sirenians, the figure for sea otters is probably low). The National Museum of Natural History has the largest collection, totaling approximately 6,900 specimens. The Los Angeles County Museum of Natural History, the Museum of Comparative Zoology at Harvard University, and the American Museum of Natural History have the next largest collections, each totaling approximately 1,100 specimens. The majority of collections (76%) are of 100 specimens or less, and 32% of these are of 10 or fewer specimens.

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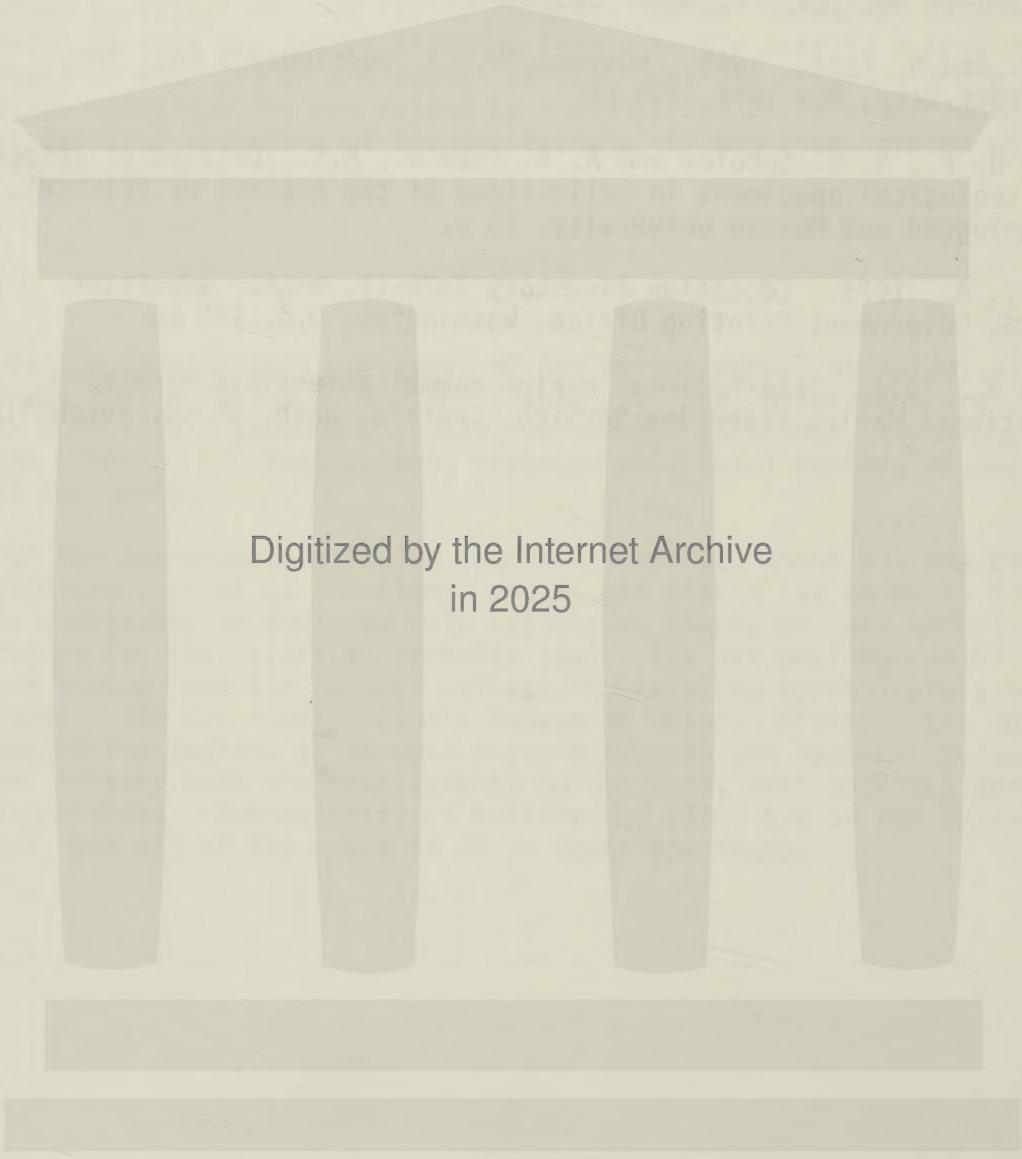

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Table 1. Institutions possessing marine mammal osteological specimens as of January 1979, based on survey.

	Name of Institution	number of cetaceans	number of pinnipeds	number of sirenians	number of sea otters	Total # of marine mammals	Contact
1.	Alaska Dept of Fish & Game Subport Bldg. Juneau, AK 99801	2	730	0	--	732	D. McKnight Game Research Chief
2.	American Museum of Natural History Central Park W. at 79th St. New York, NY 10024	327	~750	--	--	~1077	S. Anderson Curator of Mammals
3.	Bernice P. Bishop Museum P. O. Box 6037 Honolulu, HI 96818	30	15	1	--	46	A. C. Ziegler Vert. Zoologist
4.	Calif. Academy of Sciences Dept. of Birds & Mammals Golden Gate Park San Francisco, CA 94118	217	400	5	16	638	L. C. Binford Chairman
5.	Calif. Polytechnic State Univ. Biological Sciences Dept San Luis Obispo, CA 93409	31	43	0	119	193	A. I. Roest
6.	Calif. State University Dept. of Biology Fresno, CA 93710	5	0	0	--	5	K. H. Woodwick
7.	Calif. State University Dept. of Biology Hayward, CA 94542	11	9	0	1	21	H. Cogswell Curator
8.	Calif. State University Dept. of Biology 6101 East 7th Street Long Beach, CA 90804	11	17	0	3	31	Dr. Huckaby
9.	Calif. State University Dept. of Biology 5151 State University Dr. Los Angeles, CA 90032	13	6	1	--	20	
10.	Calif. State University Dept. of Biological Sciences 6000 J Street Sacramento, CA 95819	6	18	0	--	24	J. Tilley Museum Curator
11.	Carnegie Museum 4400 Forbes Avenue Pittsburgh, PA 15213	32	463	6	--	501	Curator of Mammals
12.	Charleston Museum 121 Rutledge Avenue Charleston, SC 29401	47	~4	1	1	~53	A. Sanders Curator of Natural Sciences
13.	Clemson University Dept. of Zoology Clemson, SC 29631	2	0	0	--	2	S. Miller Curator of Mammals
14.	Cornell University Bird & Mammal Museum, Bldg. 3 Ithaca, NY 14850	7	53	2	--	62	R. G. Bauer Curatorial Associate
15.	Denver Museum of Natural History* City Park Denver, CO 80205	0	27	0	--	27	H. C. Wichers Curator of Mammals

*Status of collection as of 1973.

	Name of Institution	number of cetaceans	number of pinnipeds	number of sirenians	number of sea otters	Total # of marine mammals	Contact
16.	Field Museum of Natural History Roosevelt Rd. at Lake Shore Dr. Chicago, IL 60605	86	189	27	--	302	S. Walchuk Division of Mammals
17.	Florida State Museum University of Florida Gainesville, FL 32611	85	14	89	--	188	S. Humphrey
18.	Florida State University Dept. of Biological Sciences Tallahassee, FL 32306	2	0	0	--	2	F. James
19.	Harvard University Museum of Comparative Zoology Cambridge, MA 02138	425	566	52	--	1043	E. Rutzmoser Curatorial Asst. of Mammals
20.	Hubbs-Sea World Research Inst. 1700 South Shores Road San Diego, CA 92109	--	--	--	--	~40	V. Gurevich Research Zoologist
21.	Humboldt State University Dept. of Zoology Arcata, CA 95521	98	81	1	--	180	R. Sullivan Vert. Zoology Museum
22.	Los Angeles County Museum of Natural History 900 Exposition Blvd. Los Angeles, CA 90007	716	333	7	5	1061	D. R. Patten
23.	Louisiana Polytechnic Institute Zoology Dept. Ruston, LA 71228	1	0	0	--	1	Dr. Davis
24.	Louisiana State University Museum of Zoology Baton Rouge, LA 70803	30	1	0	--	31	J. P. O'Neal
25.	Marineland of Florida Route 1, Box 122 St. Augustine, FL 32084	5	1	0	--	6	R. Jenkins
26.	Michigan State University The Museum East Lansing, MI 48823	5	24	3	--	32	J. Matson
27.	Monkshire Museum of Science Hanover, NH 03755	2	3	0	--	5	R. Chaffee
28.	National Fish & Wildlife Lab 412 NE 16th Ave., Room 250 Gainesville, FL 32601	0	0	16	0	16	B. Irvine
29.	National Marine Fisheries Service La Jolla Laboratory P. O. Box 271 La Jolla, CA 92038	53	2	0	1	56	W. F. Perrin, L. J. Hansen
30.	National Marine Fisheries Service Marine Mammal Division 7600 Sand Point Way, Bldg. 32 Seattle, WA 98115	90	271	1	3	365	C. Fiscus, pinnipeds A. Wolman, cetaceans

	Name of Institution	number of cetaceans	number of pinnipeds	number of sirenians	number of sea otters	Total # of marine mammals	Contact
31.	National Museum of Natural History Division of Mammals Smithsonian Institution Washington, D.C. 20560	3645	~2500	221	500	~6866	J. G. Mead Curator of Marine Mammals
32.	New England Aquarium Central Wharf Boston, MA 02110	6	15	0	1	22	L. Garibaldi Curator
33.	New York State Museum Washington Avenue Albany, NY 12224	18	1	0	--	19	P. Connor
34.	North Carolina State Museum P. O. Box 2281 Raleigh, NC 27611	17	3	0	--	20	D. Lee Curator of Mammals
35.	North Carolina State University Dept. of Zoology Raleigh, NC 27607	5	7	1	--	13	Dr. Barkaloo
36.	Ohio Historical Society* Natural History Division Ohio Historical Center Columbus, OH 43211	0	3	1	--	4	C. W. Albrecht Curator of Natural History
37.	Oklahoma State University Museum of Natural History Stillwater, OK 74074	6	10	0	2	18	Dr. Glass
38.	Old Dartmouth Historical Museum 18 Johnny Cake Hill New Bedford, MA 02740	1	0	0	--	1	J. R. Bockstoce
39.	Old Dominion University Hampton Blvd. Norfork, VA 23508	2	0	0	--	2	J. Merritt
40.	Oregon Institute of Marine Biology Charleston, OR 97420	8	2	0	2	12	J. Hanna
41.	Oregon State University Marine Science Center Newport, OR 97365	6	17	0	--	23	B. Mate
42.	**Peabody Museum of Natural History** Yale University New Haven, CT 06520	38	66	10	--	114	J. Ostrom
43.	Peabody Museum of Salem Salem, MA 01970	2	2	0	--	4	S. Pidugalls
44.	Philadelphia Academy of Science 19th St. and Parkway Philadelphia, PA 19103	93	137	15	--	245	F. B. Gill
45.	Princeton University Museum of Natural History Princeton, NJ 08540	12	15	2	--	29	D. Baird Geology Dept.

*Status of collection as of 1973.

	Name of Institution	number of cetaceans	number of pinnipeds	number of sirenians	number of sea otters	Total # of marine mammals	Contact
46.	San Diego Natural History Museum P. O. Box 1390 San Diego, CA 92112	101	130	3	--	234	R. M. Chandler Curator of Birds & Mammals
47.	San Diego State University 5402 College Avenue Dept. of Zoology San Diego, CA 92115	--	--	--	--	≈10	M. Novacek
48.	San Jose State University 125 South Seventh Street San Jose, CA 95162	174	103	0	--	277	J. Vollenweider Museum of Birds & Mammals
49.	Santa Barbara Museum of Natural History 2559 Puesta del Sol Road Santa Barbara, CA 93105	66	85	0	48	199	C. Woodhouse Head, Marine Mammal Program
50.	**Sea World, Inc.** **1720 South Shores Road** San Diego, CA 92109	--	--	--	--	≈50	L. H. Cornell Corporate Curator of Mammals
51.	Southern Illinois University Zoology Department Carbondale, IL 62901	1	4	0	2	7	E. C. Gallbreath
52.	Texas A & M University Texas Cooperative Wildlife Collection of Mammals College Station, TX 77843	16	0	1	--	17	D. T. Schmidly
53.	University of Alabama Museum of Natural History P. O. Box 5897 University, AL 35486	1	0	0	--	1	H. Boschuan
54.	University of Alaska Museum University of Alaska Fairbanks, AK 99701	8	487	0	8	503	S. MacDonald
55.	University of California Museum of Vertebrate Zoology 2593 Life Sciences Bldg. Berkeley, CA 94720	136	262	4	28	430	W. Z. Lidicker, Jr. Curator of Mammals
56.	University of California Department of Zoology Davis, CA 95616	12	17	1	--	30	M. Hildebrand
57.	University of California School of Veterinary Medicine Davis, CA 95616	0	10	0	--	10	L. M. Julian
58.	University of California Biology Dept., Dickey Collections Los Angeles, CA 90024	28	28	1	--	57	J. Miller Curator
59.	University of California P. O. Box 109 La Jolla, CA 92037	--	--	--	--	≈10	F. Rokop
60.	University of California Santa Cruz, CA 95060	≈20	≈10	0	--	≈30	T. Dohl

	Name of Institution	number of cetaceans	number of pinnipeds	number of sirenians	number of sea otters	Total #of marine mammals	Contact
61.	University of Colorado Museum Boulder, CO 80302	5	14	0	--	19	S. K. Wu Curator of Zoology
62.	University of Connecticut Dept. of Biological Sciences Storrs, CT 06268	2	10	0	--	12	R. Dubos
63.	University of Georgia Dept. of Zoology Athens, GA 30601	21	0	2	--	23	C. Close Museum Curator
64.	University of Kansas Museum of Natural History Lawrence, KS 66044	≈12	≈12	≈1	≈1	≈26	R. S. Hoffman Curator of Mammals
65.	University of Miami School of Marine Sciences 4600 Rickenbacker Causeway Miami, FL 33149	134	4	100	--	238	J. Reynolds
66.	University of Michigan Museum of Paleontology Ann Arbor, MI 48104	65	2	11	--	78	Dr. Smith
67.	University of Michigan Museum of Zoology Ann Arbor, MI 48104	12	24	4	--	40	P. Myers
68.	University of Minnesota Dept. of EBB 318 Church St. S.E., Zoo. Bldg. 108 Minneapolis, MN 55455	--	--	--	--	≈20	D. B. Siniff
69.	University of Missouri Museum of Zoology Columbia, MO 65201	0	60	0	--	60	Dr. Elder
70.	University of Montana Dept. of Zoology Missoula, MT 59801	3	19	1	--	23	
71.	University of New Mexico Dept. of Biology Albuquerque, NM 87106	8	10	0	--	18	J. Finley Curator
72.	University of Notre Dame Dept. of Biology Notre Dame, IN 46556	0	1	0	--	1	
73.	University of Oregon Museum of Natural History Eugene, OR 97403	4	17	1	2	24	E. Gustafson
74.	University of Puget Sound Puget Sound Museum of Natural History Tacoma, WA 98416	35	374	0	34	443	E. Kritzman
75.	University of Southern Mississippi Southern Station Box 1 Hattiesburg, MS 39401	2	0	0	--	2	Dr. Clibure

	Name of Institution	number of cetaceans	number of pinnipeds	number of sirenians	number of sea otters	Total # of marine mammals	Contact
76.	University of Texas, Austin Texas Memorial Museum 2400 Trinity Austin, TX 78705	≥1	≥6	0	--	≥7	R. Martin
77.	University of Washington Burke Museum Seattle, WA 98195	44	53	0	--	97	J. Rozdilsky Zoology Division
78.	**University of Wisconsin** Zoology Museum L.E. Noland Zoology Bldg. 434 Madison, WI 53706	--	--	--	--	≥100	E. Pillaert
79.	Virginia Polytechnic Institute and State University Dept. of Biology Blacksburg, VA 24061	3	6	2	--	11	J. Crawford
80.	Waikiki Aquarium 2777 Kalakaua Avenue Honolulu, HI 96815	0	1	0	--	1	L. Taylor
81.	Washington State University Dept. of Zoology Conner Zoology Museum Pullman, WA 99164	7	30	0	--	37	R. E. Johnson
82.	Whaling Museum Box 25 Cold Spring Harbor, NY 11724	2	0	0	--	2	R. Farwell Director

Table 2. Institutions surveyed which have no marine mammal osteological specimens.

1. Alabama Department of Conservation and Natural Resources, Montgomery, Alabama.
2. Aquarium of Cape Cod, Inc., West Yarmouth, Massachusetts.
3. Aquatic Mammals Enterprises, Key Largo, Florida.
4. Archbold Biological Station, Lake Placid, Florida.
5. Battelle Northwest Laboratories, Richland, Washington.
6. Bodega Marine Lab, Bodega Bay, California.
7. Brigham Young University, Provo, Utah.
8. California Department of Fish and Game, Sacramento, California.
9. Chicago Academy of Science, Chicago, Illinois.
10. Colorado State University, Fort Collins, Colorado.
11. Dartmouth College Museum, Hanover, New Hampshire.
12. Eastern Virginia Medical School, Norfolk, Virginia.
13. Patuxent Wildlife Research Center, Laurel, Maryland.
14. Florida Department of Natural Resources, Tallahassee, Florida.
15. Florida Southern College, Lakeland, Florida.
16. Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
17. Hawaii Institute of Marine Biology, Kaneohe, Hawaii.
18. Hopkins Marine Station, Pacific Grove, California.
19. Hubbs Seaworld Research Institute, Orlando, Florida.
20. Makapuu Oceanic Institute, Waimanalo, Hawaii.
21. Marine Sciences Research Center, Stony Brook, New York.
22. Marineland of the Pacific, Palos Verdes Peninsula, California.

Table 2. -Continued:

23. Miami Seaquarium, Miami, Florida.

24. Miami University, Oxford, Ohio.

25. Mississippi Museum of Natural Science, Jackson, Mississippi.

26. Moss Landing Marine Laboratories, Moss Landing, California. (Specimens maintained at San Jose State University)

27. Mote Marine Laboratory, Sarasota, Florida.

28. Naval Ocean Systems Center, Hawaii Laboratory, Kailua, Hawaii.

29. Naval Ocean Systems Center, San Diego Laboratory, San Diego, California.

30. Ohio State University, Columbus, Ohio.

31. Oklahoma Historical Society, Division of Museums, Oklahoma City, Oklahoma.

32. Oregon Department of Fish and Game, Portland, Oregon.

33. Osborn Laboratories of Marine Sciences, Brooklyn, New York.

34. Pennsylvania State University, University Park, Pennsylvania.

35. Philadelphia Zoological Garden, Philadelphia, Pennsylvania.

36. Point Reyes National Seashore, Point Reyes Station, California.

37. Reading Public Museum, Reading, Pennsylvania.

38. St. Norbert's College, West De Pere, Wisconsin.
(Have cetacean brain tissue and spinal cords; contact Dr. Norbert J. Flanigan)

39. Sea Life Park, Waimanalo, Hawaii.

40. Sea World, Inc., Orlando, Florida.

41. Springfield Museum of Science, Springfield, Massachusetts.

42. Stanford University, Stanford, California.
(All specimens are on long-term loan to California Academy of Science)

43. State University of New York, Stony Brook, New York.

44. University of California, Riverside, California.

45. University of California, Scripps Institution of Oceanography
La Jolla, California.

Table 2. -Continued:

46. University of Delaware, Neawark, Delaware.
47. University of Georgia Marine Institute, Sapelo Island, Georgia.
48. University of Hawaii, Honolulu, Hawaii.
49. University of Maine, Orono, Maine.
50. University of Maryland, College Park, Maryland.
51. University of Massachusetts, Amherst, Massachusetts
52. University of Nebraska-Lincoln State Museum, Lincoln, Nebraska.
53. University of New Hampshire, Durham, New Hampshire.
54. University of Oklahoma, Health Sciences Center, Oklahoma City, Oklahoma
55. University of the Pacific, Stockton, California.
56. University of Rhode Island, Kingston, Rhode Island.
57. University of Southern California, Los Angeles, California.
58. University of Tennessee, Knoxville, Tennessee.
59. U.S. Fish and Wildlife Service, Anchorage, Alaska.
60. Virginia Institute of Marine Science, Gloucester Point, Virginia.
61. Washington Department of Game, Olympia, Washington
62. West Virginia University, Morgantown, West Virginia.
63. Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.